

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 57

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte LEE CHASE, JOHN GOSS,
and PHILIP HEGLAND

Appeal No. 95-1238
Application 08/009,406¹

ON BRIEF

Before HAIRSTON, FLEMING and LEE, *Administrative Patent Judges*.
FLEMING, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on appeal from the final rejection of claims 1 through 25, all of the claims pending in the present application.

¹ Application for patent filed January 27, 1993. According to applicants, this application is a continuation of Application 07/892,595, filed May 28, 1992, which is a continuation of Application 07/552,338, filed 07/12/90, which is a continuation of Application 07/274,645, filed November 17, 1988, which is a continuation of Application 06/541,622, filed October 13, 1983.

The invention relates to an apparatus and process for measuring the percentage of ash in paper. On page 4 of the specification, Appellants disclose that Figure 2 shows a plot of x-ray energy verses mass absorption coefficient for three constituents of ash, clay indicated by line 70, titanium dioxide indicated by line 72 and calcium carbonate indicated by line 74. Appellants disclose the important feature of the graph is to illustrate that the K edges for line 72 and line 74 are very close to the same value, about 5 KeV and 4 KeV respectively. Appellants disclose that their invention takes advantage of this characteristic in which only two x-ray tubes are needed to determine the percentage of ash in paper when the ash is comprised of clay, titanium dioxide and calcium carbonate.

The independent claim 1 is reproduced as follows:

1. A process for determining the concentration of a first component of a mixture wherein the first component includes at least three materials, said process comprising:

a) directing two beams of x-rays into the mixture, at least one beam having a spectrum of x-rays having a plurality of different energies, the first beam including x-rays having an energy above the K-edges of at least two of the materials and the second beam including x-rays having an energy below the K-edges of the same at least two materials, wherein the energy distributions of the two beams are different and are such that, for each beam, the mass absorption coefficient for the same two material is substantially equal, but different from the mass absorption coefficient for the third material;

b) receiving the portions of said two beams which are transmitted through the mixture; and

c) determining the concentration of the first at least three material component based upon the two directed beams and the transmitted portion of the two beams, and not based upon any other x-ray beams.

The Examiner relies on the following references:

Arendt	3,904,876	Sept. 9, 1975
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Orval Utt et al. (Utt), "Composition Compensated Paper Ash Gauge," Industrial Nucleonics Corporation, Columbus, Ohio, 1975, pages 110-114.

Claims 1 through 25 stand rejected under 35 U.S.C. § 103 as being unpatentable over Arendt and Utt. On pages 3 and 4 of the answer, the Examiner states that Arendt teaches in column 3, lines 47-65, a method of measuring the percentages of the ash by using a first energy higher than the K absorption edge of titanium oxide, a second energy between the K absorption edges of titanium oxide and calcium carbonate and a third energy which is below the K absorption edge of clay. On pages 4 and 5 of the answer, the Examiner states that Arendt uses the Lambert's law in which three separate x-ray energies are used to measure titanium oxide, calcium carbonate and clay. The Examiner states on page 4 of the answer that Utt reveals in Figure 2 that the absorption coefficients of titanium oxide and calcium carbonate are about the same at the energies of 4.1 and 6.2 KeV. The Examiner argues

that it would have been obvious to simplify the Arendt invention by assuming that the absorption coefficients of titanium oxide and calcium carbonate are equal as taught by Utt and thus utilizing only two x-ray energies instead of three x-ray energies as taught by Arendt.

Rather than reiterate the arguments of Appellants and the Examiner, reference is made to the briefs² and answer for the respective details thereof.

OPINION

We will not sustain the rejection of claims 1 through 25 under 35 U.S.C. § 103.

The Examiner has failed to set forth a ***prima facie*** case. It is the burden of the Examiner to establish why one having ordinary skill in the art would have been led to the claimed invention by the express teachings or suggestions found in the prior art, or by implications contained in such teachings or suggestions. ***In re Sernaker***, 702 F.2d 989, 995, 217 USPQ 1, 6

² Appellants filed an appeal brief on February 9, 1994. We will refer to this appeal brief as simply the brief. Appellants filed a reply appeal brief on October 24, 1994. We will refer to this reply appeal brief as the reply brief. The Examiner stated in the Examiner's letter dated September 5, 1996 that the reply brief has been entered and considered but no further response by the Examiner is deemed necessary.

(Fed. Cir. 1983). "Additionally, when determining obviousness, the claimed invention should be considered as a whole; there is no legally recognizable 'heart' of the invention." ***Para-Ordnance Mfg. v. SGS Importers Int'l, Inc.***, 73 F.3d 1085, 1087, 37 USPQ2d 1237, 1239 (Fed. Cir. 1995), ***citing W. L. Gore & Assocs., Inc. v. Garlock, Inc.***, 721 F.2d 1540, 1548, 220 USPQ 303, 309 (Fed. Cir. 1983), ***cert. denied***, 469 U.S. 851 (1984).

Appellants argue on pages 10 and 11 of the brief that Arendt and Utt, together or individually, fail to teach or suggest a system or process that uses two x-ray beam energies to determine the combined amount of two materials, the amount of a third material and the total amount of a component of at least three materials. Appellants argue on pages 11 through 22 that there is no motivation or suggestion to modify Arendt's use of three x-ray energies to determine the individual amounts of the three material to using only two x-ray energies to determine the combined amount of two materials, the amount of a third material and the total amount of a component of at least three materials.

The Federal Circuit states that "[t]he mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification." ***In re Fritch***,

972 F.2d 1260, 1266 n.14, 23 USPQ2d 1780, 1783-84 n.14 (Fed. Cir. 1992), **citing In re Gordon**, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984). "Obviousness may not be established using hindsight or in view of the teachings or suggestions of the inventor." **Para-Ordnance Mfg. v. SGS Importers Int'l**, 73 F.3d at 1087, 37 USPQ2d at 1239, **citing W. L. Gore & Assocs., Inc. v. Garlock, Inc.**, 721 F.2d at 1551, 1553, 220 USPQ at 311, 312-13.

We note that neither Ardent nor Utt teaches that it is desirable to only determine the combined amount of titanium oxide and calcium carbonate, the amount of clay and the total amount of a the three materials, titanium oxide, calcium carbonate and clay. Ardent teaches in column 2, line 40 through column 5, line 15, a process of determining the amounts of titanium oxide, calcium carbonate and clay by using three separate x-ray energy beams. Ardent further teaches that the primary advantage of the invention is, instead of the usual six wavelengths that would normally be expected for determination for three materials, the Ardent system only requires absorption measurements on three wavelengths. Ardent further emphasizes this point in column 5, line 16 through column 6, line 20, by providing the general equations for determining three different elements of unknown quantity by passing three different monochromatic energies

through a sample. However, Arendt fails to teach or suggest using absorption measurements on only two x-ray wavelengths in order to determine the combined amount of titanium oxide and calcium carbonate, the amount of clay and the total amount of the three materials, titanium oxide, calcium carbonate and clay.

Utt fails to teach or suggest using absorption measurements on only two x-ray wavelengths as well. We fail to find that Utt teaches in Figure 2 that the absorption coefficients of titanium oxide and calcium carbonate are about the same as argued by the Examiner in the answer. Utt's Figure 2 shows three separate curves for attenuation coefficients for titanium oxide and calcium carbonate. Utt does not teach or suggest using absorption measurements on only two x-ray wavelengths in order to determine the combined amount of titanium oxide and calcium carbonate, the amount of clay and the total amount of the three materials, titanium oxide, calcium carbonate and clay.

We fail to find any suggestion in either reference to modify Arendt to obtain Appellants' claimed invention. Since there is

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no evidence in the record that the prior art suggested the desirability of such a modification, we will not sustain the Examiner's rejection of claims 1 through 25. Accordingly, the Examiner's decision is reversed.

REVERSED

KENNETH W. HAIRSTON)	
Administrative Patent Judge)	
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)	
MICHAEL R. FLEMING)	BOARD OF PATENT
Administrative Patent Judge)	APPEALS
)	AND
)	INTERFERENCES
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JAMESON LEE)	
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